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PERFORMANCE OBJECTIVES.

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THE IMPORTANCE OF EXPRESSING INSTRUCTIONAL OBJECTIVES IN TERMS OF OBSERVABLE STUDENT PERFORMANCE IS EMPHASIZED THROUGHOUT THIS REPORT. ONE SECTION, WHICH ILLUSTRATES PERFORMANCE CRITERIA IN THE TEACHING OF HAIKU, ARRANGES INSTRUCTIONAL OBJECTIVES UNDER THE HEADINGS OF CONTENT CLASSIFICATION, PURPOSE, CRITERION PERFORMANCE, SAMPLE TEST SOLUTION, TAXONOMY, CATEGORY, AND RESOURCES. IN AN ADDITIONAL SECTION THE EFFECT OF NEW INSTRUCTIONAL OBJECTIVES ON CURRICULUM IS DISCUSSED. IT IS FELT THAT AS INSTRUCTIONAL OBJECTIVES CHANGE THERE WILL BE AN INCREASING EMPHASIS ON INDIVIDUALIZED INSTRUCTION, SELF-DIRECTED LEARNING, AND THE INTEGRATION OF DISCRETE SUBJECT AREAS, AND THAT ADMINISTRATIVE AND CURRICULAR REFORMS WILL BE NEEDED. THE FINAL SECTION OF THE REPORT CONTAINS AN OUTLINE OF A SAMPLE TEACHER EDUCATION OBJECTIVE AND A TEST FOR THE RECOGNITION OF PERFORMANCE CRITERIA. (LB)

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Performance Objectives

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SECTION I

WORKING OUT INSTRUCTIONAL OBJECTIVES

For many years, educators have talked about the importance of instructional objectives. The purpose of an instructional objective is to make clear to teachers, students, and other interested persons what it is that needs to be taught - or what it is that has been taught.

A well-written instructional objective should say three things. It should say what it is that a student who has mastered the objective will be able to do. It should say under what conditions the student will be able to do this. It should say (when appropriate) to what extent the student will be able to do this. To put the matter in a single sentence, a well-written instructional objective should specify under what conditions and (when appropriate) to what extent a certain kind of student performance can be expected to take place.

This is often a difficult thing for teachers to learn to do. The main reason for this would seem to be that in education the word objective has generally meant purpose. And when educators speak of purpose, they almost invariably use words such as understanding, comprehension, and appreciation. These point to noble aims, no question about that. But when left wholly in this form they do not refer to anything that is directly observable and, therefore, do not permit us to evaluate how well we are doing whatever it is we are trying to do.

The trick is to supplement each announcement of purpose with a statement of criterion performance. That is to say, each declaration of an instructional aim should be accompanied by a clear description of what the learner must be able to do in order to demonstrate his accomplishment of the objective.

The emphasis here is on the word do. And the doing must be observable. A warm feeling in the pit of the stomach is not sufficient.

Question: Which one of the following two statements is expressed in terms of observable student performance?

A. The student will have a good understanding of the letters of the alphabet, A through Z.

B. The student will be able to pronounce the names of the letters of the alphabet, A through Z.

Statement B tells what it is that the student will be able to do. He will be able to pronounce the names of the letters of the alphabet, A through Z.

Statement A tells us that the student will have a good understanding of the letters of the alphabet. But this is not very clear. We cannot tell what it is that the student is supposed to be able to do as a result of this understanding.

Let's try another pair of statements. Which one is expressed in terms of observable student performance?

A. The student will have an adequate comprehension of the mechanics of punctuation.

B. Given a sentence containing an error in punctuation, the student will correct the mistake.

Statement B tells what it is that the student will do. He will correct the error in punctuation.

Statement A, which says that the student will have an adequate comprehension of the mechanics of punctuation, is rather cloudy. We cannot tell what it is that the student is supposed to be able to do as a result of his comprehension.

At this point, an objection may be raised. Isn't the person who is comprehending something doing something? Isn't intellectual performance an acceptable kind of student performance?

Certainly. The difficulty is that mental activity, as such, is not directly observable. We cannot literally open up a person's head and see the thinking that is going on inside. If it is to be of use to us, a statement of performance must specify some sort of behavior that can be observed.

This does not mean that we are not concerned about intellectual performance. It does mean that since mental activity, as such, is not directly observable, some sort of behavior that is observable will have to stand for or represent the intellectual performance we have in mind.

For example, suppose that we are interested in having students know something about the writing style of Ernest Hemingway. Whatever may be intellectually involved in the attainment of this goal, it should be apparent that the language of our aim as stated leaves much to be desired.

What is the student who knows able to do that the student who does not know is not able to do? This is the important question because, until we have worked out a clear answer to it, we cannot measure the accomplishment of our instructional purpose. Although there is no single answer to the question we have posed (our objective of "knowing something" is too vague for that), here is a possible statement of desired performance:

> Given ten pairs of short prose passages - each pair having one selection by Ernest Hemingway and one by a different author - the student is able, with at least 90% accuracy, to choose the ten selections written by Hemingway.

A well-written statement of desired performance should not only say what it is that a student who has mastered the objective will be able to do. It should also say under what conditions the student will be able to do this.

Here is one of our earlier statements concerning the alphabet:

> The student will be able to pronounce the names of the letters of the alphabet, A through Z.

We have said that this statement <u>is</u> expressed in terms of student performance. Does this statement also set forth the <u>conditions</u> under which the performance is to take place?

No, it does not. For one thing, we cannot tell from our statement whether the student is to pronounce the names of the letters <u>at sight</u> or <u>from memory</u>. If the letters are to be shown, we do not know whether the student is to work with capital letters, small letters, or both. Nor do we know whether the student is to work with these letters in regular sequence or in random order. Each set of conditions is substantially different from the rest, and will make its own special demands upon the student who attempts to accomplish the objective.

Let's examine two more statements. Which one sets forth the <u>conditions</u> under which a certain kind of performance is to take place?

A. Given the Dolch list of the ninety-five most common nouns, the student will be able to pronounce correctly all the words on this list.

B. The student will be able to pronounce correctly at least 90% of all words found in most beginning reading books.

Statement A, which tells us that the Dolch list of the ninety-five most common nouns will be used, sets the conditions for the demonstration of student mastery. We are told that these particular words, and no others, are the ones at issue for this objective.

Statement B, offering us only the dubious clue of "words found in most beginning reading books," does not tell us enough. Our conditions need to be defined more precisely than this.

We come now to the matter of performance <u>level</u>. A well-written statement of performance will establish an acceptable minimum standard of achievement.

Look at this statement:

> Given twenty sentences containing both common and proper nouns, the student will be able to identify with very few mistakes both kinds of nouns.

Does this statement establish a minimum standard of achievement?

No, it does not. To say that the student is to perform "with very few mistakes" leaves open the question: how many mistakes are only a very few?

Here is the Hemingway exercise we looked at earlier:

> Given ten pairs of short prose passages - each pair having one selection by Ernest Hemingway and one by a different author - the student is able, with at least 90% accuracy, to choose the ten selections written by Hemingway.

Does this establish a minimum standard of achievement?

Yes, it does. The student is expected to be able, "with at least 90% accuracy, to choose the ten selections written by Hemingway." This constitutes a minimum standard of achievement.

Let's try one more example:

> The student should be able to pronounce from memory, and in sequence, the names of the letters of the alphabet, A through Z.

Does this establish a minimum standard of achievement:

Yes, it does. The statement implies that we are looking for 100% mastery. However, we could, if we wanted to be explicit, re-state the desired performance in this way:

> The student should be able to pronounce from memory, in sequence, and with 100% accuracy, the names of the letters of the alphabet, A through Z.

In a related manner, some learning tasks justifiably present the student with an all-or-nothing situation. For example, if the learner is supposed to be able to tie his shoe laces, it would not make sense to talk about his being able to do this with 90% accuracy. Here the proposition is absolute: He either can tie his shoe laces, or he cannot. There is nothing in-between.

An instructional objective should <u>not</u> ordinarily be limited to specific <u>means</u> (particular materials or methods), but should be stated in terms that permit the use of various procedures. Look at this statement of performance:

> Given the California Test Bureau's E-F level programmed booklet on capitalization, the student is able to work through the exercises in this booklet with at least 90% accuracy.

Is this statement limited to the use of a particular instructional item or procedure?

Yes, it is. The desired performance is expressed exclusively in terms of work with a specific booklet. Although the particular kind of skill development that is promoted by this booklet is presumably also fostered by other instructional materials and methods, no such options are available under the terms of our statement of performance as it is now written.

Look at this statement of desired performance:

> Given twenty sentences containing a variety of mistakes in capitalization, the student is able, with at least 90% accuracy, to identify and re-write correctly each word that has a mistake in capitalization.

Is this objective limited to the use of a particular instructional item or procedure?

No, it is not. The desired performance, as now stated, permits us to use a number of instructional items that show promise in being able to help students

attain the objective. These items might include not only the California Test Bureau's E-F level material, but the somewhat simpler C-D level presentation, a programmed booklet by D. C. Heath, Unit 11 of English 2200, Unit 9 of English 2600, Lessons 87 and 88 of English 3200, several filmstrips on capital letters, and so on.

Finally, a well-written instructional objective will suggest how its accomplishment can be measured. This follows from our view that a well-written objective specifies under what conditions and (when appropriate) to what extent a certain kind of student performance can be expected to take place.

Look at this objective:

The student should know the alphabet.

Does this objective suggest how its accomplishment can be measured?

No, it does not. The reason for this is that knowing the alphabet can mean different things to different people. Therefore, depending upon what is meant, the measuring of this knowing will take different forms.

Suppose we elaborate upon our objective so that it reads:

> Shown the letters of the alphabet in random order (in both upper and lower case form), the student is able to say the name of each letter with 100% accuracy.

Does our objective now suggest how its accomplishment can be measured?

Yes, it does. It tells us that the student will be shown the letters of the alphabet, that he will be shown these letters in both upper and lower case form and in random order, and that he will be called upon to say with 100% accuracy the name of each letter shown. The objective, in other words, makes it plain how its accomplishment can be measured.

Our in-service work in connection with individualized instructional projects in the Duluth Public Schools has gradually led to the creation of the following six-point format for developing instructional objectives:

INSTRUCTIONAL OBJECTIVE

1. Content Classification
2. Purpose
3. Criterion Performance
4. Sample Test Situation
5. Taxonomy Category
6. Resources

We have already touched briefly on the matters of purpose, criterion performance, and sample test situation. Perhaps the best way of reviewing these elements, as well as explaining the remaining points listed above, is to construct an example that will illustrate in detail what we mean.

We shall choose an objective from the magic realm of creativity. There is a reason for doing this. Many people have the feeling that while objectives expressed in terms of observable student behavior can be put together for some of the basic skills areas (i.e. map reading, spelling, etc.), nothing much can be done in this way when it comes to the humanities. If, therefore, our example can help to disprove this notion, we shall have served in double measure the cause of performance objectives.

The objective we have in mind has to do with the writing of haiku, Japanese poetry that contains three rhymeless lines of five, seven, and five syllables, respectively, for a total of seventeen syllables.

Far from being an anemic academic exercise, the discipline of haiku somehow releases creative energies that are often imprisoned within the unlimited boundaries of student prose.

Now let us turn to the task of setting forth our haiku objective under the headings of (1) content classification, (2) purpose, (3) criterion performance, (4) sample test situation, (5) taxonomy category, and (6) resources.

Content classification simply means the placement of an objective somewhere in a course or subject matter outline. In the present instance, we might treat this heading as follows:

CONTENT CLASSIFICATION

I. Imaginative Use of Language

A. Poetry

(1) Haiku

The purpose of our objective is this:

PURPOSE

To engage students in a formal poetic exercise that will encourage brevity, relevance, and the use of words in fresh, new ways.

Criterion performance we have discussed at length:

CRITERION PERFORMANCE

Given any item of experience (music, literature, film, an observed event, a recollection), the student will be able to make a personal response in the form of a haiku (seventeen syllables, 5-7-5, in three lines) of his own creation.

Next, the sample test situation. As our criterion performance makes plain, we have plenty of latitude here. One interesting possibility is to present the student with a literal English translation of some Japanese haiku, and ask him to write his own haiku based upon whatever this translation suggests to him.

SAMPLE TEST SITUATION

"Here is the literal English translation of a Japanese haiku: Caged-bird/butterflies/ envy/eye-expression.

"Look at the words carefully. Then write a haiku of your own, capturing whatever meaning the literal translation suggests to you."

In case you are wondering what a student might do with this problem, here is what one ninth grade girl came up with:

"The caged yellow bird
envies the spring butterflies'
remorseless freedom."

In keeping with our six-part format, we come now to the task of identifying the taxonomy category that most nearly fits our instructional objective. In developing this feature, we have been strongly influenced by Bloom's Taxonomy of Educational Objectives: Cognitive Domain.

The Bloom taxonomy uses six categories: knowledge, comprehension, application, analysis, synthesis, and evaluation.

Although we have found Bloom's suggested hierarchy stimulating to explore, and most helpful in making us keenly aware of a broad range of intellectual activities, we have gradually come around to working with a simpler taxonomy of our own construction.

Our classification scheme employs four categories. These are knowledge, comprehension, application, and invention.

As is true of the Bloom taxonomy, our categories for classifying intellectual tasks are not as clear and distinct as one might wish. This is partly because cognitive accomplishments often include activities that are, in turn, appropriate to different categories. Perhaps the best way to resolve this difficulty is to focus upon the main thrust of an instructional objective and classify it accordingly.

It should also be remembered that an intellectual task is frequently defined by the nature of the test items or situation used to measure its achievement. For example, if items identical to those the student has practiced on are used in the test situation, the subsequent feat of learning is probably one of simple recall or recognition in spite of itself.

Let us consider each of our four categories: knowledge, comprehension, application, and invention.

The emphasis in our knowledge category is on simple recall and recognition - in other words, on memory. The student remembers specific items: names, statements, objects, procedures, etc.

For example, the student who learns to arrange the letters of the alphabet in order from A to Z has acquired knowledge. That is to say, the order of the letters is arbitrary and, therefore, must be memorized.

Similarly, the student who is able to list a minimum of ten characteristics for each of the nine planets has acquired knowledge. The learning task involved is presumably largely one of memorization.

Perception rather than memory is the hallmark of our comprehension category. Here the student identifies and continues patterns (not by remembering them, but by observation).

He matches or completes equivalencies and non-equivalencies, and he perceives other relationships in material presented to him.

If, for example, when given two objects, the student is able to indicate a length comparison (longer than, shorter than, same length as), he has demonstrated comprehension. Or, given a list of ten latitudes numbered in degrees, if the student is able to categorize them correctly under the headings, Region

of High Temperatures, Region of Middle Temperatures, and Region of Low Temperatures, he has demonstrated comprehension.

For our application category, the student selects and then uses one or more principles to produce or alter something. For example, if a student decides upon and then uses a certain formula to solve a problem, he has shown that he can apply what he has learned. He works upon material according to definite rules which he perceives as being appropriate. Nevertheless, he does not go beyond these rules and principles. Initially, and as a learning task, application is a deliberate and highly conscious act, although in time it may become merely a routine operation scarcely above the threshold of awareness.

A student qualifies for our invention category when he produces, uses, or alters something in a form or manner that in some way goes beyond any existing structures or principles of which he is aware. For example, after having studied the physical structure of insects, if the student is able to construct a taxonomy of his own which would consist of categories into which all of the insects studied could be sorted according to their structures, he would have invented something.

Examining our haiku objective in the light of these considerations, it would seem that creative writing falls naturally into the category of invention. So let's put it there:

TAXONOMY CATEGORY

Invention

Resources are the final part of our format. What is needed here is a listing of various instructional means (tapes, films, records, filmstrips, printed matter, activities) that may be used to help students achieve the criterion performance. Resource items should not simply be assigned en masse,

but should in each instance be used selectively, depending on the situation for any given student. In the case of our haiku objective, appropriate resource items might include:

RESOURCES

An Introduction to Haiku (an anthology of poems and poets from Basho to Shiki, with translations and commentary by Harold G. Henderson)

Borrowed Water (a book of American haiku by the Los Altos Writers Roundtable)

American Haiku Magazine (a magazine devoted exclusively to the development of English language haiku)

Good Night, Socrates (film)

The Red Balloon (film)

The Golden Fish (film)

The Smile (film)

Nahanni (film)

Eugene Atget (film)

etc.

The three items of printed matter listed above provide a certain amount of background information about the nature of haiku, and some examples of this form of poetry. The film listings (which could be expanded almost indefinitely) can be used to trigger the responses of students. And when what they have to say is shaped by the discipline of haiku, the results are often gratifying and sometimes moving.

For example, let's take the film, Good Night, Socrates. In bland, diluted prose, here is how one student reacted to what she saw:

> This movie was something different than anything I have ever seen. I didn't realize there are people living like that in the United States. It wasn't the condition of the buildings or anything. They weren't the best but at least they were home. It was that they lived in their own world. That boy was growing up in a totally Greek atmosphere. The people were satisfied with it too. In fact they liked it. It was very hard to be thrown out of their home and town for something like better looks. They will never live the same way again. Maybe it would have been better if they stayed that way. At least there wasn't much discrimination.

Later, in haiku, here is what this girl wrote about Good Night, Socrates:

> The fragile bubbles
> tremble and break before me.
> I see my world fall.

Same student. Same film. The difference, I think, can only be attributed to the form of expression.

However, the pleasure of promoting haiku as a worthy exercise in the mother tongue is not to our main purpose. The point is: we have talked at some length about the need for expressing instructional objectives in terms of observable student behavior. It would be difficult to over-emphasize the importance of doing this. For once this has been accomplished, other problems can be solved more easily. Indeed, if teachers at all levels of schooling would be this explicit in working out instructional objectives, they might reasonably hope to eliminate almost immediately one cause of learning failure among students: the traditional fuzziness of classroom assignments.

SECTION II

EDUCATIONAL OBJECTIVES AND THE CURRICULUM

"It is my prediction," says R. Louis Bright, Associate Commissioner for Research, U. S. Office of Education, "that within another ten years almost the entire academic portion of instruction will be on an individual basis in most schools."

If Mr. Bright's statement turns out to forecast correctly the coming shape of American education, it is my prediction that this development will have been supported primarily by a new breed of educational objectives. The "new Look" in instructional aims will depart sharply from the traditional North-Central-Accreditation variety of educational goals. No longer will it be sufficient to speak generally of such things as "understanding," "comprehension," and "appreciation." To be sure, these words point to worthy ends. This much is not in question. The trouble is: We are left in the air by statements of aims that do not indicate what observable events will represent accomplishment of those aims. They do not permit us to know how well we are doing whatever it is we are trying to do. It is in this sense that the traditional formulation of educational objectives is inadequate.

Putting the quality of subject matter content aside for the moment, an adequate educational objective should provide the following information: It should tell us in the clearest possible way exactly <u>what it is</u> that the <u>student</u> who has achieved the objective will be able to do. It should set forth (whenever it makes sense to do so) the <u>minimum</u> <u>standard</u> of acceptable student performance. And it should describe plainly the <u>conditions</u> under which the student will be expected to accomplish the objective.

Some examples are in order.

Here are two statements of an educational objective. Which one is expressed in terms of observable student performance? (I am indebted for these and other examples to many teachers, both within and without the Duluth Public Schools, for their efforts to improve the specificity of educational objectives.)

A. Given three pieces of paper of any size, the student will be able to cut a circle from each piece of paper and place these circles on a surface with the smallest circle to his left and the largest circle to his right.

B. Given fifteen statements concerning the peace settlement at the Congress of Vienna in 1815, the student will be able to understand which ones relate to the concept of legitimacy and which ones relate to the concept of balance of power.

Statement A says what it is that we could observe the student doing or having done. The student, we are told, will <u>cut</u> three circles, then <u>place</u> these in a certain relationship to each other. <u>Cutting</u> and <u>placing</u> are observable activities. And, in the case of this particular objective, they suggest a tangible product: three paper circles in a specified arrangement.

Statement B starts out as though it means business, but soon fades into the vagaries of that state of bliss called <u>understanding</u>. What is it that the student will be able to do because he understands? We are on tiptoes with curiosity. Yet we are told no more. The objective grows mute. Presumably, the student is going to do something about these fifteen statements. But what? Punctuate them? Read them aloud? Re-write them?

This judgment may seem too harsh. After all, isn't the person who is <u>understanding</u> something <u>doing</u> something? Isn't <u>thinking</u> an acceptable kind of student performance? Aren't we interested in mental activity?

Of course. The problem is that intellectual behavior, in and of itself, is not directly observable. Its presence must therefore be verified by some other event that is observable. We must specify what sort of overt behavior we are willing to have stand for or represent the cognitive achievement we are seeking.

In the present instance, our Congress of Vienna objective might be modified to read: Given fifteen written statements concerning the peace settlement at the Congress of Vienna in 1815, the student will, in front of each statement, write the letter L if the statement relates to the concept of legitimacy, write the letter P if the statement relates to the concept of balance of power, write the letter B if the statement relates to both concepts, and write the letter N if the statement relates to neither concept.

We have said that, whenever it makes sense to do so, an adequate educational objective should set forth a minimum standard of acceptable student performance. Notice that our Congress of Vienna objective does not explicitly do this. That is to say, as it is now written, the objective makes no allowance for error. This is all right - if this, in fact, is the intent. However, if the teacher would be willing to settle for something less than errorless performance, this fact should be written into the objective. A single sentence could be added: The student will be expected to make not more than two mistakes in accomplishing this objective.

An adequate educational objective will describe the conditions under which the student is to achieve the objective.

Look at this statement of criterion performance: The student will be able to pronounce the names of the numerals, 1 through 20.

This objective is expressed in terms of observable behavior. Does it also specify the conditions under which the behavior is to take place?

It does not. First of all, our objective does not reveal whether the student is to pronounce the names of the numerals at sight or from memory. Further, if the numerals are to be shown, we cannot tell whether the student is to work with these numerals in regular sequence or in random order. The one set of conditions is obviously not the same as the other. Each will make its own demands upon the student who tries to achieve the objective.

We might, therefore, clarify our objective: Shown the numerals, 1 through 20 (in random order), the student, without error, will be able to pronounce the name of each numeral as it is shown.

Summarizing what we have said thus far, an adequate educational objective will specify under what <u>conditions</u> and (when appropriate) to what extent a certain kind of student <u>performance</u> may be expected to take place.

Educational objectives expressed in terms of observable behavior will enable students to take on an increasing measure of responsibility for their own learning. Three years of work with individualized instruction in the Duluth Public Schools have led to the creation of a six-point format for instruction that, hopefully, will promote this kind of student initiative. The assumption here is that clearly stated learning tasks will encourage the development of better learning strategies.

Our six-point approach for working with educational objectives may be described under the following headings:

CONTENT CLASSIFICATION

PURPOSE

CRITERION PERFORMANCE

SAMPLE TEST SITUATION

TAXONOMY CATEGORY

RESOURCES

Perhaps the best way to explain these headings is to construct an educational objective that can be used to illustrate what we mean. For this purpose we shall choose an objective that might well be included in teacher education programs throughout the land. The one we have in mind has to do with that maddening man of modern media, Marshall McLuhan.

Let us begin.

Our first heading, Content Classification, merely refers to the placement of our objective somewhere in the overall scheme of instruction. Ordinarily, this might mean fixing it within a course or subject matter outline. How and where this would be done would presumably depend upon the teacher who was planning to employ the objective. In the case of our Marshall McLuhan objective, a universe of possibilities would appear to be available. However, without worrying overmuch on this score, we might start by putting it under Philosophy of Education with the realization that further subdivisions would then be in order.

Our second heading, Purpose, is simply a brief explanation of why we think our McLuhan objective has merit: According to the February 21, 1967,

issue of LOOK Magazine, "Marshall McLuhan is perhaps the most provocative and controversial thinker of this generation. His books, such as Understanding Media, have challenged many established notions about man and civilization. Now director of the Center for Culture and Technology at the University of Toronto, Professor McLuhan next fall will take the $100,000-a-year Albert Schweitzer Chair in the Humanities at Fordham University in New York." The purpose of this objective is to acquaint teacher candidates with the views of this man who says, "By the time this year's babies have become 1989's graduates (if college 'graduation' then exists), schooling as we now know it may be only a memory."

Our third heading, Criterion Performance, expresses in terms of observable behavior what it is that the teacher candidate will be able to do to show that he has mastered the objective: Given twenty statements, each purporting to reflect the thinking of Marshall McLuhan, the teacher candidate will be able with at least 90% accuracy to identify which statements do in fact represent McLuhan's views.

Our fourth heading, Sample Test Situation, sets forth a few test items of the kind that will be used to check out the teacher candidate on the achievement of the objective:

Which of the following statements represent the thinking of Marshall McLuhan?

1. The medium is the message.
2. Television is hot
3. Print is cool
4. The key word in the new Electric Age is involvement.

Our fifth heading, Taxonomy Category, classifies our objective into one of several categories appropriate to the cognitive domain. Here any one of a number of taxonomies might be considered. Especially popular has been Bloom's Taxonomy of Educational Objectives: Cognitive Domain. Certainly, this work has much merit. Nevertheless, it should not be swallowed whole.

For example, this particular taxonomy uses six major classes: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. One Page 147, under Analysis, we find: "Ability to detect logical fallacies in arguments." On page 189, under Evaluation, we find: "The ability to indicate logical fallacies in arguments."

Now unless one wishes to make a federal case out of the distinction between "detect" and "indicate," we must conclude, I think, that some fuzziness has crept into the scheme of things. And this is understandable. On the positive side, what this discovery does for us is to give us back the courage of our convictions. We no longer feel wholly dependent on the mother ship. We are ready to do a little independent cruising on our own.

In any event, our McLuhan objective should presumably be classified as either Knowledge or Comprehension. Assuming that the twenty statements we shall use in the test situation will involve more than simple recall or recognition (that is to say, more than mere memory work), we are left with the obvious choice of Comprehension. So let's choose the obvious.

Our sixth, and last, heading is Resources. What is wanted here is a listing of materials, procedures, persons, activities, etc., that could be used to help the teacher candidate attain the objective. For our McLuhan

objective, we might include the following items:

A. Book: Understanding Media, by Marshall McLuhan

B. Article: "The Future of Education: The Class of 1989," by Marshall McLuhan and George B. Leonard in LOOK Magazine, February 21, 1967, page 23

C. Article: "The Message of Marshall McLuhan," by Edwin Diamond in NEWSWEEK Magazine, March 6, 1967, page 53

D. Film: "Child of the Future" (National Film Board of Canada)

E. Book: The Medium is the Massage, by Marshall McLuhan and Quentin Fiore

F. Article: "From Instruction to Discovery," by Marshall McLuhan in MEDIA & METHODS Magazine, October, 1966, page 8

G. Article: "What TV is Really Doing to Your Children," by Marshall McLuhan in FAMILY CIRCLE Magazine, March, 1967, page 33

H. Film: "The Medium is the Massage" (McGraw-Hill Book Company)

I. Article: "Marshall McLuhan Massages the Medium," by Marshall McLuhan in NATION'S SCHOOLS, June, 1967, page 36

J. Article: "A Schoolman's Guide to Marshall McLuhan," by John M. Culkin, SATURDAY REVIEW, March 18, 1967

Putting together the six-point format for our McLuhan objective, we would have the following:

SAMPLE TEACHER EDUCATION OBJECTIVE

Content Classification

Philosophy of Education

Purpose

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next fall will take the $100,000-a-year Albert Schweitzer Chair in Humanities at Fordham University in New York." The purpose of this objective is to acquaint teacher candidates with the views of this man who says, "By the time this year's babies have become 1989's graduates (if college 'graduation' then exists), schooling as we now know it may be only a memory."

Criterion Performance

Given twenty statements, each purporting to reflect the thinking of Marshall McLuhan, the teacher candidate will be able with at least 90% accuracy to identify which statements do in fact represent McLuhan's view.

Test Situation

Which of the following statements represent the thinking of Marshall McLuhan?

1. The medium is the message.
2. Television is hot.
3. Print is cool.
4. The key word in the new Electric Age is involvement.

Taxonomy Category

Comprehension

Resources

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There is, of course, nothing final about this suggested approach for working with educational objectives. The essential point is that any format can be useful insofar as it lets the student know (a) what is expected of him, (b) how he will be evaluated, and (c) what means may help him succeed.

If we want students to grow in the ability to organize their own learning, care must be taken to establish a learning environment that will promote this result. Educational objectives are never achieved in a vacuum. Means shape ends.

R. L. Bright's belief that individualized instruction will sweep the field within a decade poses some important questions: What is meant by individualized instruction? Is it synonymous with independent study? Is it feasible? What are some implications for present-day educational institutions?

Everyone has his own notion as to what constitutes individualized instruction. In my view, it means an arrangement that makes it possible for each student to be engaged at all times in learning those things that are most beneficial to himself as an individual. It is probable that this state of affairs can never be fully realized. The best we can do is to approximate it.

Individualized instruction is not the same as independent study. Assuredly, independent study is, at appropriate times, a vital element of individualized instruction. Nevertheless, individualized instruction is the larger aim. Independent study simply contributes toward its attainment. Confusion on this point has apparently led some people to suggest that individualized instruction cannot be instituted at the kindergarten-primary levels.

The issue is not whether kindergarten children can be turned loose to direct their own schooling. The question is: To what extent can we provide a variety of learning activities that (a) will be highly motivating, (b) will have enough self-instructional features to ease the problem of classroom management, (c) can accommodate a wide range of individual differences, and (d) will encourage the accomplishment of worthy objectives?

Let's attempt to clarify further the relationship between individualized instruction and independent study. Among other things, it seems to me that formal schooling should be trying to develop human beings who will become competent, <u>life-long</u> learners. This is a formidable task. It must begin early - when the child first enters school - and continue throughout the years of formal instruction.

At the heart of the matter lies practice, learning by doing. This should proceed in stages, moving gradually from teacher-directed to self-directed learning. The antithesis of this approach is exemplified at high school commencement exercises where, at the close of twelve or thirteen years of over-supervision, we earnestly tell the graduates, "Remember, this is not an end but a beginning." Then we say, in effect, "From now on, it's either sink or swim. You're on your own. It's strictly up to you."

Following this send-off, forty percent of the college-bound fail or drop out of that institution during their freshman year. As for the others, including the ones who can't or won't pursue some kind of further schooling - well, they struggle along as best they can. And a growing number of these wind up unemployed: a far cry indeed from the ideal of responsible, life-long, self-directed learning.

The trouble is not simply that students have failed to acquire the habits of independent study (although it is that also). More to the point is the fact that schools have not been organized to encourage students to function independently when, individual by individual, they become ready to do so. As for the proposition that such readiness itself can be taught - this has scarcely been explored in any significant way.

Individualized instruction, when it is serious and not merely sincere, can help students move toward the ideal of self-directed learning. For maximum effectiveness, this must be done on an individual basis. The reason for this is that what will be most suitable for one student at a given time will not necessarily be best for another. We have all heard over the years the silly argument that rages around the question of teaching kindergarten children to read. Much of the controversy might lead you to suppose that these youngsters had all been cut from the same mold. Fortunately, the issue quickly becomes ridiculous as soon as we stop to look at a particular boy or girl and ask: Is this child ready to learn to read? (Or perhaps even better: What might we do to help this child become ready to read?)

It is one thing to talk a good game of individualizing instruction. Educators have been doing this for years. It is something else to make the institutional changes necessary to move us within shooting distance of the target.

What are some of the things that need to be done?

We could make considerable progress by abolishing subject matter time schedules. Modular scheduling is a step forward in this respect, but

(at least in its current phase) it is still basically a conservative movement that tends to substitute one set of restrictions for another. Although modular arrangements have succeeded in breaking through the unvarying 45- to 55-minute time slots that characterize most traditional secondary schools today, the typical "flexible schedule" often has its own rigidities that are only just beginning to yield to such devices as open laboratory periods of long duration. A more vigorous push for freedom is called for. From the third grade on, there is no sound reason why an individualized program cannot offer substantial opportunities for each student to budget his own time. Here again performance objectives are the key. For when these are clearly formulated, they make it administratively feasible within wide limits for every learner to schedule his own activities. Indeed, it would not be amiss to call this scheduling by objectives.

Performance objectives suggest another reformation in formal schooling. This one has to do with the traditional sanctity of subject matter boundaries. I can remember being a college student before it occurred to me that the things I was studying in various courses were somehow related. I do not believe my experience was unique. When subjects are taught in isolation, one from another, it is hardly surprising that students do not perceive the connections that exist among different fields. The steady growth of special terminologies within the disciplines only heightens the barriers to communication. The problem is a serious one and needs concentrated attention.

Some anxiety has been expressed in recent years over the increasing inability of scholars to talk with each other. This concern is not misplaced.

Whatever near equivalencies do exist (and there are presumably many) need to be revealed for the benefit of all.

In the public schools, a renewed effort to see life whole has expressed itself in humanities courses introduced at the secondary level. The central purpose of the humanities (when it is seen as being something more than a survey of the fine arts) is to pose, and attempt to answer, man's most enduring question, "Who am I?"

Such an undertaking requires that subject matter lines be crossed with inpunity. In fact, it may be desirable to think of the entire curriculum as consisting of two major divisions: a basic skills division, and a humanities division.

Customarily, certain subjects have been taught single-mindedly as basic skills. Science, for example, has generally meant frogs and test tubes. Mathematics has been almost exclusively concerned with the manipulation of the language of numbers. All well and good, as far as this goes.

Nevertheless, both science and mathematics should occupy outposts of influence within the humanities. The compelling ways in which science as a method has re-stitched the fabric of our times must receive fundamental attention. And mathematics, insofar as automation is based upon it, must accept partial responsibility for the coming redefinition of work and leisure in our society.

In this view of the humanities, all subjects have their parts to play. And the time to begin is when the child first enters school. In Bruner's frequently quoted words, "It is possible to teach any subject to any child at any age in some form that is honest - and interesting. The challenge

is to find how to represent the idea in a mode that is within the child's reach and then to proceed from there to a more precise and deeper representation."

Performance objectives also mean that we must eliminate the kind of formal schooling whose annual beginnings and endings move in time to the less-than-pervasive rhythms of an agricultural society. Courses of study that commence in September and finish in May or June violate a basic premise of individualized instruction: namely, that what animates effective education is the development of competencies rather than the serving of time. Although the citizens of our nation take vacations that are, increasingly, scattered throughout the year, our educational institutions continue to make Mother and Dad feel like criminals for taking Suzy out of school during February. Adherence to performance objectives would quickly do away with this archaic approach to instruction.

Finally, performance objectives will depend for their care and keeping upon a new product that has not yet come forth from college and university teacher education departments. This new product is the teacher for the decade ahead. Because teachers tend to teach in the way they have been taught, it is of crucial importance that institutions of higher learning - now, and without delay - begin a radical revamping of their teacher education programs. This is no time for peripheral considerations that involve sprucing up a course here and there, or altering an occasional requirement for graduation. What is wanted is a complete overhauling of the existing structure. As a starter, this might include: (a) the placing of teacher candidates in a completely individualized program of education (b) the use of performance objectives as

the basic ingredient of teacher education, and (c) making it possible for teacher candidates to begin working with children at the beginning of the candidate's career preparation, not toward the close of it.

Other developments would also seem indicated, among them the abolishment of formal classes as such, and the creation of new kinds of learning spaces appropriate to the task at hand. In some instances, these latter things have already occurred. Indeed, some of the physical changes in buildings appear to have advanced substantially beyond what's happening inside.

In any case, the basic job remains to be done. The university professor in general, and the professor of teacher education in particular, is a difficult animal to reform. Whether the strong and growing interest in education throughout the country will eventually induce him to cooperate is a moot point. Only time will tell.

SECTION III.

SAMPLE INSTRUCTIONAL OBJECTIVE

CONTENT CLASSIFICATION

I. Imaginative Use of Language

A. Poetry

(1) Haiku

PURPOSE

To engage students in a formal poetic exercise that will encourage brevity, relevance, and the use of words in fresh, new ways.

CRITERION PERFORMANCE

Given any item of experience (music, literature, film, an observed event, a recollection), the student will be able to make a personal response in the form of a haiku (seventeen syllables, 5-7-5, in three lines) of his own creation.

SAMPLE TEST SITUATION

"Here is the literal English translation of a Japanese haiku: Caged-bird/ butterflies/envy/eye-expression.

"Look at the words carefully. Then write a haiku of your own, capturing whatever meaning the literal translation suggests to you."

TAXONOMY CATEGORY

Invention

RESOURCES

An Introduction to Haiku (an anthology of poems and poets from Basho to Shiki, with translations and commentary by Harold G. Henderson)

Borrowed Water (a book of American haiku by the Los Altos Writers Roundtable)

American Haiku Magazine (a magazine devoted exclusively to the development of English language haiku)

Good Night, Socrates (film)

The Red Balloon (film)

The Golden Fish (film)

The Smile (film)

Nahanni (film)

Eugene Atget (film)

etc.

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CLASSIFYING COGNITIVE INSTRUCTIONAL OBJECTIVES

The following categories for classifying intellectual tasks are not as clear and distinct as one might wish. This is partly because cognitive accomplishments often include activities that are, in turn, appropriate to different categories. Perhaps the best way to resolve this difficulty is to focus upon the main thrust of an instructional objective and classify it accordingly. It should also be remembered that an intellectual task is frequently defined by the nature of the test items or situation used to measure its achievement. For example, if items identical to those the student has practiced on are used in the test situation, the subsequent feat of learning is probably one of simple recall or recognition in spite of itself.

KNOWLEDGE CATEGORY: The emphasis in this category is on simple recall and recognition - in other words, on memory. The student remembers specific items: names, statements, objects, procedures, etc. For example, the student who learns to arrange the letters of the alphabet in order from A to Z has acquired knowledge. That is to say, the order of the letters is arbitrary and, therefore, must be memorized. Similarly, the student who is able to list a minimum of ten characteristics for each of the nine planets has acquired knowledge. The learning task involved is presumably largely one of memorization.

COMPREHENSION CATEGORY: Perception rather than memory is the hallmark of this category. Here the student identifies and continues patterns (not by remembering them, but by observation). He matches or completes equivalencies and non-equivalencies, and he perceives other relationships in material presented to him. If, for example, when given two objects, the student is able to indicate a length comparison (longer than, shorter than, same length as), he has demonstrated comprehension. Or, given a list of ten latitudes numbered in degrees, if the student is able to categorize them correctly under the headings, Region of High Temperatures, Region of Middle Temperatures, and Region of Low Temperatures, he has demonstrated comprehension.

APPLICATION CATEGORY: For this category, the student selects and then uses one or more principles to produce or alter something. For example, if a student decides upon and then uses a certain formula to solve a problem, he has shown that he can apply what he has learned. He works upon material according to definite rules which he perceives as being appropriate. Nevertheless, he does not go beyond these rules and principles. Initially, and as a learning task, application is a deliberate and highly conscious act, although in time it may become merely a routine operation scarcely above the threshold of awareness.

INVENTION CATEGORY: A student invents something when he produces, uses, or alters something in a form or manner that in some way goes beyond any existing structures or principles of which he is aware. For example, after having studied the physical structure of insects, if the student is able to construct a taxonomy of his own which would consist of categories into which all of the insects studied could be sorted according to their structures, he would have invented something.

Thorwald Esbensen
Duluth Public Schools
August, 1966

RECOGNIZING PERFORMANCE CRITERIA

Leaving the matter of content aside, decide for each statement below whether it is expressed in terms of observable student performance.

1. Given a programmed booklet on Alaska, the student should, after carefully reading the booklet, be able to have a better understanding of the white man's influence upon the Eskimo culture.

2. Given a string of beads which form a number and color pattern, the student should, by adding more colored beads to the string, be able to continue the pattern.

3. Given a hypothetical need for a new law which will be initiated by a branch of Minnesota government, and a randomly arranged list of steps that must be taken in order to create the law, the student should be able to list the necessary steps in correct sequence.

4. Given a set of tonal patterns based on piano tape-recorded combinations of the tonic triad and the major scale, and given the key signature of each pattern, the teacher candidate should be able to notate them on the treble clef with 100% accuracy in pitch and rhythm.

WRITE YOUR LETTER IN THE FIRST ANSWER BOX

5. Given a magazine containing the needed illustrations, the student should be able to find at least ten pictures of people producing goods or services, label these according to occupation, and state in writing what goods or services result from the work shown (90% minimum accuracy required).

6. Given a list of activities carried on by the early settlers in Duluth, the student should be able to know what goods they produced, what productive resources they used, and what trading they did.

7. Given the statement, "Changing tastes of the American consumer changed the occupations required in our economy," the student should be able to comprehend the meaning of this statement.

8. Given the total amount of a loan, the monthly rate of interest, and the monthly payment rate, the student should be able to compute in writing the amount of principal repaid each month, the interest paid each month, the number of monthly payments necessary to repay the loan, and the effective annual interest rate.

WRITE YOUR LETTER IN THE SECOND ANSWER BOX

9. Given a list of twenty words, the student should be able to perceive that these words are arranged in alphabetical order according to the beginning letter of each word.

10.. Given twenty statements, each purporting to reflect the thinking of Marshall McLuhan, the student should be able, with at least 90% accuracy, to say which statements do represent McLuhan's views.

11. Given twenty dictated words containing the consonant elements m, p, n, t, th, f, and the short vowels a and i, the student should be able to hear, with at least 90% accuracy, the designated consonant elements and short vowels in the dictated words.

12. Given the poem "The Sword" by William Blake, the student should be able to think of at least one way in which the symbolism in the poem could be interpreted.

WRITE YOUR LETTER IN THE THIRD ANSWER BOX

13. Given access to Heilbrenner's The Worldly Philosophers, the student should be able to have an intellectual grasp of the different points of view expressed in this book.

14. Given the terms, closed shop, collective bargaining, yellow-dog contract, and interlocking directorate, the student should be able to develop an adequate understanding of each term.

15. Given a short story containing periods, question marks, exclamation points, quotation marks, and commas, the student should be able to have an awareness of the meaning of each kind of punctuation.

16. Given a set of three numerals that name whole numbers not greater than six, the student should be able to list the four related addition and subtraction equations suggested by the numbers.

WRITE YOUR LETTER IN THE FOURTH ANSWER BOX

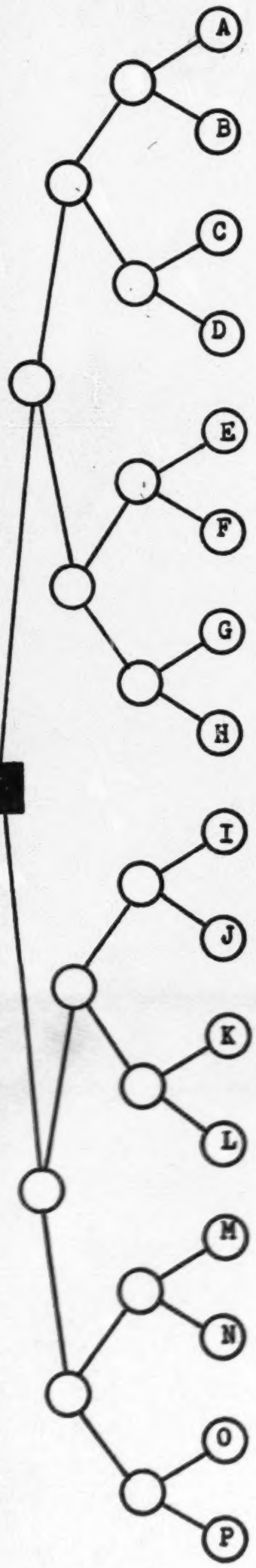
17. Given the price of two different-sized packages of a product and the quantity of the product contained in each, and assuming equal quality, the student should be able to see how the unit price of each was determined.

18. Given an advertisement, the student should be able to comprehend (a) how the advertisement catches the consumer's interest, (b) what information is given about the product, and (c) what information is given that is unrelated to the product.

19. Given the characteristics of a material for use as money, and the description of a situation in which silver became unavailable, the student should be able to understand how one or more other materials might be substituted.

20. Given the results of liver function tests performed on six jaundiced patients, the student should be able to list correctly at least five of the cases under the etiological headings of homolytic, hepatoullular, and obstructive jaundice.

WRITE YOUR LETTER IN THE LAST ANSWER BOX



STUDENT.....

TEST.....

1	5	9	13	17
2	6	10	14	18
3	7	11	15	19
4	8	12	16	20

A	B	C	D	E	F	G	H
Aoooo	Aooox	Aooxo	Aooxx	Aoxoo	Aoxox	Aoxxo	Aoxxx
Booox	Boooo	Booxx	Booxo	Boxox	Boxoo	Boxxx	Boxxo
Cooxo	Cooxx	Coooo	Cooox	Coxxo	Coxxx	Coxoo	Coxox
Dooxx	Dooxo	Dooox	Doooo	Doxxx	Doxxo	Doxox	Doxoo
Eoxoo	Eoxox	Eoxxo	Eoxxx	Eoooo	Eooox	Eooxo	Eooxx
Foxox	Foxoo	Foxxx	Foxxo	Fooox	Foooo	Fooxx	Fooxo
Goxxo	Goxxx	Goxoo	Goxox	Gooxo	Gooxx	Goooo	Gooox
Hoxxx	Hoxxo	Hoxox	Hoxoo	Hooxx	Hooxo	Hooox	Hoooo
Ixooo	Ixoox	Ixoxo	Ixoxx	Ixxoo	Ixxox	Ixxxo	Ixxxx
Jxoox	Jxooo	Jxoxx	Jxoxo	Jxxox	Jxxoo	Jxxxx	Jxxxo
Kxoxo	Kxoxx	Kxooo	Kxoox	Kxxxo	Kxxxx	Kxxoo	Kxxox
Lxoxx	Lxoxo	Lxoox	Lxooo	Lxxxx	Lxxxo	Lxxox	Lxxoo
Mxxoo	Mxxox	Mxxxo	Mxxxx	Mxooo	Mxoox	Mxoxo	Mxoxx
Nxxox	Nxxoo	Nxxxx	Nxxxo	Nxoox	Nxooo	Nxoxx	Nxoxo
Oxxxo	Oxxxx	Oxxoo	Oxxox	Oxoxo	Oxoxx	Oxooo	Oxoox
Pxxxx	Pxxxo	Pxxox	Pxxoo	Pxoxx	Pxoxo	Pxoox	Pxooo

I	J	K	L	M	N	O	P
Axooo	Axoox	Axoxo	Axoxx	Axxoo	Axxox	Axxxo	Axxxx
Bxoox	Bxooo	Bxoxx	Bxoxx	Bxxox	Bxxoo	Bxxxx	Bxxxo
Cxoxo	Cxoxx	Cxooo	Cxoox	Cxxxo	Cxxxx	Cxxoo	Cxxox
Dxoxx	Dxoxo	Dxoox	Dxooo	Dxxxx	Dxxxo	Dxxox	Dxxoo
Exxoo	Exxox	Exxxo	Exxxx	Exooo	Exoox	Exoxo	Exoxx
Fxxox	Fxxoo	Fxxxx	Fxxxo	Fxoox	Fxooo	Fxoxx	Fxoxo
Gxxxo	Gxxxx	Gxxoo	Gxxox	Gxoxo	Gxoxx	Gxooo	Gxoox
Hxxxx	Hxxxo	Hxxox	Hxxoo	Hxoxx	Hxoxo	Hxoox	Hxooo
Ioooo	Iooox	Iooxo	Iooxx	Ioxoo	Ioxox	Ioxxo	Ioxxx
Jooox	Joooo	Jooxx	Jooxo	Joxox	Joxoo	Joxxx	Joxxo
Kooxo	Kooxx	Koooo	Kooox	Koxxo	Koxxx	Koxoo	Koxox
Looxx	Looxo	Looox	Loooo	Loxxx	Loxxo	Loxox	Loxoo
Moxoo	Moxox	Moxxo	Moxxx	Moooo	Mooox	Mooxo	Mooxx
Noxox	Noxoo	Noxxx	Noxxo	Nooox	Noooo	Nooxx	Nooxo
Ooxxo	Ooxxx	Ooxoo	Ooxox	Oooxo	Oooxx	Ooooo	Oooox
Poxxx	Poxxo	Poxox	Poxoo	Pooxx	Pooxo	Pooox	Poooo